

REMARKS/ARGUMENTS

In this Amendment, Applicants have amended independent claim 1 to more particularly claim Applicants' invention. Claim 1 now claims that the beam splitting means splits a laser beam into three or more laser beam splits that are different in optical path.

As also claimed in claim 1, in Applicants' invention, the beam combining means comprises a total reflection/transmission type beam combining means and a polarizing type beam combining means. The optical paths of two of the beam splits are aligned in essentially the same direction by the total reflection/transmission type beam combining means. These two beams splits and the third beam split are aligned essentially in the same direction by the polarizing type beam combining means.

As will be further explained below, Applicants respectfully submit that neither Montgomery, Lizotte, nor Sakamoto disclose the claimed three or more laser beam splits in combination with the claimed total reflection/transmission type beam combining means and the polarizing type beam combining means which align the three beam splits.

As disclosed in Applicants' specification at para. 0007, the present invention provides a laser machining apparatus in which three or more beam splits are made incident on one machining lens so that machining can be performed at a high speed, and the machining quality (shapes, dimensions, accuracy and straightness of machined holes) is excellent. As discussed above, the present invention utilizes a total reflection/transmission type beam combining means to align two of the beam splits in essentially the same direction. As shown in Figure 2 and as discussed at paras. 0015-0016 of Applicants' application, the total reflection/transmission type beam combining means comprises a triangular prism 81 and a triangular prism 82. The triangular prism 81 and the triangular prism 82 are disposed so that an inclined plane 83 and an inclined plane 84 are opposed to each other at a fixed distance. Antireflection coating is applied onto the inclined planes 83 and 84 and surfaces

85 and 86 through which beams will pass. Paras. 0017-0019 describe how incident beams coming in from one direction exit in two directions almost perpendicular to each other and how beams entering from two directions almost perpendicular to each other exit in one direction. As explained at para. 0018, use of this total reflection/transmission type beam combining means can keep energy loss quite low. As explained, the energy of a beam penetrating the inclined plane 83, 84 is substantially equal to the energy of a beam totally reflected by the inclined plane 83, 84.

Applicants respectfully submit that neither Montgomery, Lizotte, nor Sakamoto disclose a total reflection/transmission type beam combining means as claimed and as such, claim 1 is allowable for at least this reason.

Further in Applicants' invention, as described at para. 0030 and as shown in Figure 1, a laser beam passing through aperture 11 is split into three beams by beam splitters 12 and 13. The three beams are shown as beams "A", "B", and "C". Para. 0033 describes that the total reflection/transmission type beam combining means 31c is positioned to transmit beam A, incident from the left side of Figure 1, and reflect beam B, incident from the lower side of Figure 1, to the right side of Figure 1. Thus, as claimed, the optical paths of these two beam splits are aligned essentially in the same direction by the total reflection/transmission type beam combining means. (See also specification para. 0045). As further explained at paras. 0037 and 0047, these beams A and B are reflected by the polarizing type beam combining means 32 while the beam C is transmitted by the polarizing beams combining means 32. Thus, as claimed, the optical paths of the beam splits (A, B, and C) are aligned in essentially the same direction by the polarizing type beam combining means. Thus, three or more laser beams can be made incident on one machining lens 45. (See paras. 0048 and 0062).

Applicants also respectfully submit that not only do Montgomery, Lizotte, and Sakamoto not disclose the claimed structure of Applicants' invention of a total reflection/transmission type beam combining means, but additionally, they

do not disclose Applicants' claimed polarizing type beam combining means and the claimed relationship between these structures and the three or more laser beams. Applicants respectfully submit that even if any of these references disclose simultaneously irradiating a plurality of work locations with beam splits which are essentially parallel, as argued by the Examiner in the Office Action, they do not disclose Applicants' particularly claimed total reflection/transmission type beam combining means and polarizing type beam combining means and the claimed relationship between these structures and the three or more laser beams. Applicants respectfully request that if the Examiner disagrees with Applicants' arguments, that the Examiner particularly point out the disclosure in the references that the Examiner believes discloses Applicants' claimed invention.

Further in this Amendment, Applicants have provided substitute paras. 0004 and 0005 for the specification. Applicants respectfully submit that the substitute paragraphs overcome the Examiner's objections to the specification.

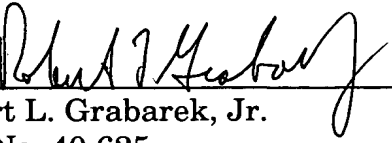
Applicants respectfully submit that the application is now in condition for allowance. If there are any questions regarding this Amendment or the application in general, a telephone call to the undersigned would be appreciated since this should expedite the prosecution of the application for all concerned.

As discussed above, this Paper should be considered as a Petition for an Extension of Time sufficient to effect a timely response. Please charge any such fee or any deficiency in fees, or credit any overpayment of fees, to Deposit Account No. 05-1323 (Docket 029116.53329US).

Respectfully submitted,

CROWELL & MORING LLP

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Linda Bakke

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